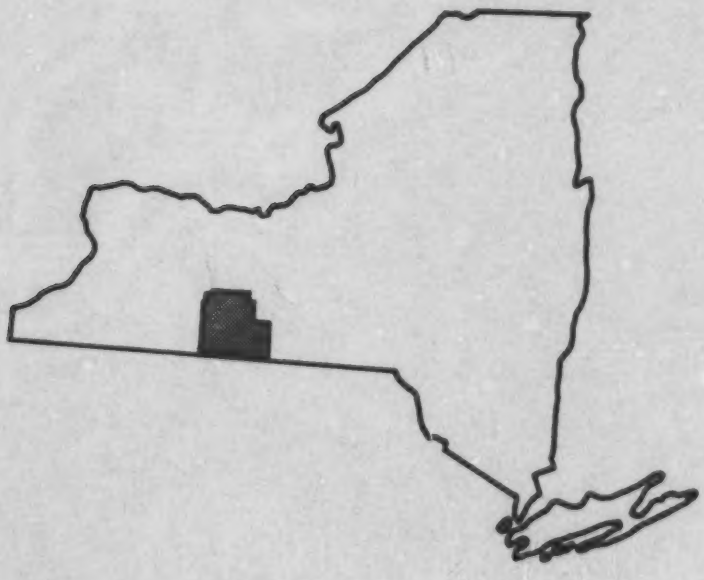
360773

NEWARK PUBLIC LIBRARY
MAY 18 1981
U. S. GOVT. PUBS.
DEPOSITORY 376

FLOOD INSURANCE STUDY

TOWN OF CORNING, NEW YORK
STEUBEN COUNTY



FEBRUARY 3, 1981

federal emergency management agency
federal insurance administration

COMMUNITY NUMBER - 360773

FEM 1.209

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
	1.1 Purpose of Study	1
	1.2 Coordination	1
	1.3 Authority and Acknowledgements	1
2.0	AREA STUDIED	2
	2.1 Scope of Study	2
	2.2 Community Description	2
	2.3 Principal Flood Problems	4
	2.4 Flood Protection Measures	4
3.0	ENGINEERING METHODS	5
	3.1 Hydrologic Analyses	5
	3.2 Hydraulic Analyses	7
4.0	FLOOD PLAIN MANAGEMENT APPLICATIONS	8
	4.1 Flood Boundaries	9
	4.2 Floodways	9
5.0	INSURANCE APPLICATION	10
	5.1 Reach Determinations	10
	5.2 Flood Hazard Factors	13
	5.3 Flood Insurance Zones	15
	5.4 Flood Insurance Rate Map Description	16

TABLE OF CONTENTS - continued

	Page
6.0 OTHER STUDIES	16
7.0 LOCATION OF DATA	16
8.0 BIBLIOGRAPHY AND REFERENCES	17

FIGURES

Figure 1 - Vicinity Map	3
Figure 2 - Floodway Schematic	13

TABLES

Table 1 - Summary of Discharges	6
Table 2 - Floodway Data	11-12
Table 3 - Flood Insurance Zone Data	14

EXHIBITS

Exhibit 1 - Flood Profiles
Chemung River — Panels 01P-03P
Whiskey Creek — Panels 04P-08P

Exhibit 2 - Flood Boundary and Floodway Map Index

Exhibit 3 - Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index

Flood Insurance Rate Map

FLOOD INSURANCE STUDY
TOWN OF CORNING, NEW YORK

1.0 INTRODUCTION

1.1 Purpose of Study

The purpose of this Flood Insurance Study is to investigate the existence and severity of flood hazards in the Town of Corning, Steuben County, New York and to aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Initial use of this information will be to convert Corning to the regular program of flood insurance by the Federal Insurance Administration (FIA). Further use of the information will be made by local and regional planners in their efforts to promote sound land use and flood plain development.

1.2 Coordination

Flood discharge information was coordinated with the Baltimore District of the U. S. Army Corps of Engineers (COE), the Ithaca District of the U. S. Geological Survey (USGS), and the New York State Office of the Soil Conservation Service (SCS). The hydraulic data were coordinated with the COE and the SCS.

A final Consultation and Coordination Officer's (CCO) meeting was held on March 1, 1976. Revisions have since been made to the study as a result of the construction of the Tioga-Hammond and Cowanesque Dams. Therefore, an additional CCO meeting was held on May 7, 1979, attended by representatives of the FIA, the Town of Corning and Susquehanna River Basin Commission (SRBC).

1.3 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968, as amended.

The hydrologic and hydraulic analyses for this study were performed by the Susquehanna River Basin Commission for the Federal Insurance Administration, under an amendment to Contract H-3824. This work, which was completed in November 1977, covered all significant flooding sources in the Town of Corning.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the incorporated area of the Town of Corning, Steuben County, New York. The area of study is shown on the Vicinity Map (Figure 1).

The Chemung River and a portion of Whiskey Creek, from the confluence with the Chemung River to the pumping substation, was studied by detailed methods. A portion of the Chemung Feeder Canal, along the corporate limits with the Town of Big Flats, was also studied by detailed methods. The areas studied by detailed methods were selected with priority given to all known flood hazard areas and areas of projected development and proposed construction for the next five years, through November 1982.

The Chemung Feeder Canal, Markle Hollow, Cutler, Erwin, Post, and Whiskey Creeks were studied by approximate methods. Approximate methods of analysis were used to study those areas having low development potential and minimal flood hazards as identified at the initiation of the study. The scope and methods of study were proposed to and agreed upon by the FIA.

2.2 Community Description

The Town of Corning is located in the southeastern part of Steuben County, in southwestern New York. The Town of Corning is bordered on the north by the Town of Hornby, on the east by the Town of Big Flats, on the south by the Town of Caton, and on the west by the Town of Erwin. Under the State Law of 1801, Corning was formed and at that time, named Painted Post. The name was changed to the Town of Corning in 1852. In 1970, a total population of 5,198 resided within the 36.5 square-mile area of the Town of Corning. The population of the town increased by 22.2 percent between 1960 and 1970.

The Chemung Feeder Canal flows from a point in the Old Canal bed west of the mouth of Winfield Creek, through the breach in the old canal bed, to its confluence with Gardner Creek in Big Flats.

The Chemung River flows east and southeast through the center of the town. °Of the several tributaries draining into the Chemung River within the town, Cutler, Post, and Whiskey Creeks are the largest and most important. Cutler and Post Creeks flow in a southerly direction through the northwestern part of the town to the Chemung

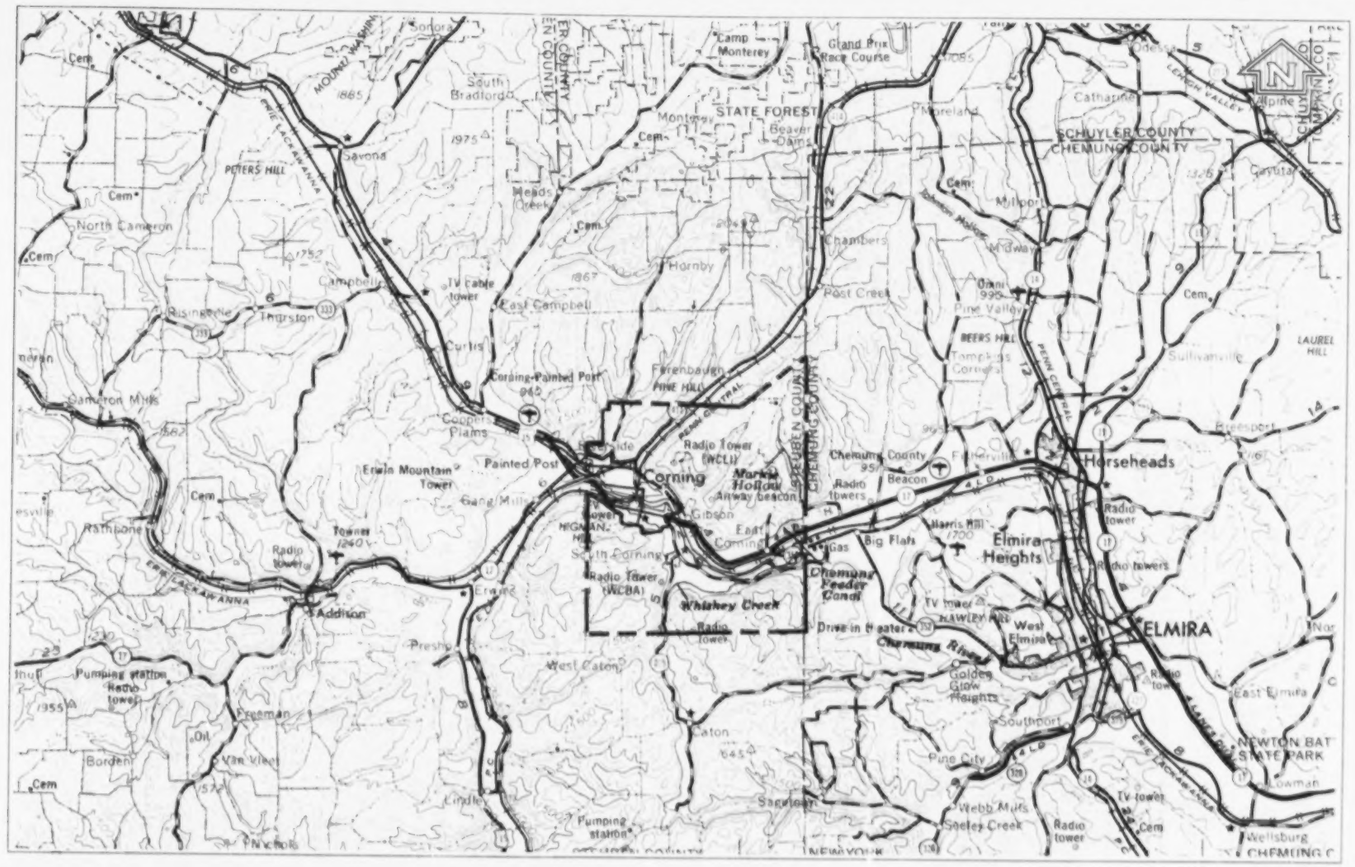


FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

APPROXIMATE SCALE
4 0 4 8 12 MILES

VICINITY MAP

River within the City of Corning and Village of Riverside, respectively. Whiskey Creek flows north through the central part of the town to the Chemung River.

The area of Corning is primarily undeveloped on the steep, wooded upland slopes. Scattered farms are located on the less steeply sloped areas. The rural, undeveloped areas of Corning surround the Corning urban area which occupies much of the Chemung River flood plain. Development in this area is residential and is concentrated within the river and stream flood plains.

The climate in the area is generally continental, but is modified by the effects of the Atlantic Ocean and the Gulf of Mexico.

2.3 Principal Flood Problems

Historic data and the findings of this study show that the Chemung River is the principal source of flooding problems in the Town of Corning. Cutler, Post, and Whiskey Creeks are secondary sources of flooding in smaller, less developed areas.

Flood plain development within the Town of Corning has been damaged during periodic past floods. The most notable of these floods occurred in 1946 and 1972. A less severe, but more recent flood in September 1975 caused damage along the Chemung River. The flood in June 1972, caused by Hurricane Agnes, was the largest of record on the Chemung River. A discharge value of 189,000 cubic feet per second (cfs) was recorded downstream of the study area at the Chemung, New York river gage, which is located 10 miles upstream from the mouth of the Chemung River. The gage has been in operation for 63 years. The 1972 flood was considered to be a 500-year flooding event. The May 1946 flood, which was caused by intense rainfall on previously saturated ground, had a discharge value of 132,000 cfs, and was considered to be a 100-year flood (Reference 1). The recurrence intervals were determined without consideration of the storage capacity of the Tioga-Hammond and Cowanesque Dams and are therefore no longer valid.

2.4 Flood Protection Measures

There are no local flood protection projects existing or proposed to reduce the flood hazard to the Town of Corning. Four existing upstream dams, Arkport Dam on the Canisteo River, Almond Dam on Canacadea Creek, the Tioga-Hammond Dam on the Tioga River and Crooked

Creek, and the Cowanesque Dam on the Cowanesque River, contribute to the reduction of flood hazards in the Town of Corning. The effects of these new dams are included in this study. With these dams in operation, the 1946 and 1972 discharges would be significantly reduced due to the additional storage provided by the dams.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Floods having recurrence intervals of 10, 50, 100, and 500 years have been selected as having special significance for flood plain management and for flood insurance premium rates. The analyses reported here reflect current conditions in the watersheds of the flooding sources.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail in the community.

Discharges for the Chemung River were obtained from discharge-frequency curves for stream gages at the Town of Corning as prepared by the COE (Reference 2). This gage has been in operation for 63 years. The Town of Corning gage is located about 1.8 miles downstream from the western boundary of the Town of Corning.

Discharge values for 10-, 50-, 100-, and 500-year return periods at the gaging stations were plotted against drainage area on log-log paper. Values for the area were obtained from this plot using the appropriate drainage area.

Discharges for Cutler, Erwin, Post, and Whiskey Creeks were obtained from the regional flood frequency procedure developed by the COE (Reference 3). This method is based on the log-Pearson Type III analysis of a large number of station records in the Susquehanna River Basin, through 1972 (Reference 4). The coefficients for this method were modified in accordance with the analysis made for Newtown Creek and other smaller streams in the vicinity. The discharges for Newtown Creek were obtained from a frequency curve developed by the SCS (Reference 5). The SCS frequency curve compared closely to a frequency curve computed for the USGS stream gage on Newtown Creek (Reference 1). All flood discharges were determined by the Susquehanna River Basin Commission (SRBC).

The 100-year flood discharge for the Chemung Feeder Canal was taken from the Flood Damage Reduction Study by SRBC and from the Flood Insurance Study for the Town of Big Flats (References 6 and 7). A capacity of 700 cfs was determined for the Chemung Feeder Canal by running water-surface profiles using the HEC-2 step-backwater computer program (Reference 8). Overflow from the canal upstream of Goff Road overtops the right bank levee and flows towards the southwest into the gravel pits. Downstream of Goff Road, overflow again occurs over the right bank levee and flows through the depression between the canal and State Route 17.

Upstream of Goff Road, the sum of the hydrographs for Winfield Creek and the two streams west of it were obtained. Discharge greater than 700 cfs, the channel capacity of the canal, was diverted out of the watershed toward the gravel pits in East Corning, using the Divert Option in the TR-20 computer program (Reference 9). The discharge remaining in the canal (700 cfs or less) was stream routed towards Gardner Creek. Local inflow was then added and discharge greater than 700 cfs which overtopped the right bank of the canal was stream routed through the depression between the canal and State Route 17 using the TR-20 computer program (Reference 9).

A summary of peak discharges for the Town of Corning is shown in Table 1. The discharges in Table 1 reflect the peak flow of floods that will occur after the completion of the dams. The discharges previously mentioned for the 1946 and 1972 floods on the Chemung River were done so without consideration of the effects of the dams and, therefore will not be consistent with the recurrence interval of flows shown in Table 1.

TABLE 1 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA (sq. miles)	PEAK DISCHARGES (cfs) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CHEMUNG RIVER					
At downstream corporate limit	2,000	40,800	65,900	80,000	123,000
WHISKEY CREEK					
At confluence with Chemung River	16.9	2,080	3,950	4,950	8,400

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the flooding sources studied in detail were carried out to provide estimates of the elevations of floods of the selected recurrence intervals along each of these flooding sources.

Cross sections were located at regular intervals along the stream length and at significant changes in ground relief, land use or land cover. Ground elevations for the cross sections were interpolated from contours and spot elevations on 1:2,400 scale base maps (Reference 10). Channel bottom elevations for the Chemung River were obtained from existing profiles (Reference 11). Channel bottom elevations for Whiskey Creek were taken from field-surveyed profiles.

Water-surface elevations of floods of the selected recurrence intervals were computed through use of the COE HEC-2 step-backwater computer program (Reference 8). Water-surface elevations for the Chemung River were started using elevations obtained from a Flood Insurance Study for the Town of Big Flats (Reference 6). Backwater computations for Whiskey Creek were started using elevations obtained from a rating curve on the Chemung River at its confluence with Whiskey Creek. The elevation corresponded to the mean flow of the Chemung River and the peak flow on Whiskey Creek.

Manning's "n" values were evaluated from aerial and ground level photographs, topographic maps and on-site field examinations. The "n" values were selected from tables published by Ven Te Chow and the Bureau of Public Roads, based on channel conditions and overbank vegetation or land use (References 12 and 13). Within the Town of Corning, the Chemung River channel "n" values ranged between 0.035 and 0.054 and the overbank "n" values ranged between 0.051 and 0.092. The procedure used to obtain "n" values and starting water-surface elevations for Whiskey Creek were essentially the same except that it was not possible to verify the profiles using known high-water marks. The channel "n" value for Whiskey Creek was 0.040 and the overbank "n" value was 0.065.

The hydraulic computer model was tested, and the "n" values were adjusted within an acceptable range to best fit known high-water marks and elevations at gaging stations for the Chemung River from the mouth of Seeley Creek to the junction of the Tioga and Cohocton Rivers. All gaging station elevations were determined by the study contractor based on established rating curves. High-water marks

obtained by the USGS for the June 1972 flood were used (Reference 14). The 1972 flood had a recurrence interval which was greater than 500 years. When a satisfactory model was achieved, water-surface profiles were computed for floods with recurrence intervals of 10, 50, 100, and 500 years.

A ponding area, caused by inadequate drainage through the Owen Hollow and Gardner Creeks culverts (in the Town of Big Flats), was identified by the analyses performed for the Flood Insurance Study of Big Flats (Reference 6). This area of ponding extends into Corning. Flows through the culverts were analyzed by developing culvert rating curves and storage rating curves (Reference 6). The water-surface elevation in this area is 899.

Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals. Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway is computed (Section 4.2), selected cross-section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 3).

The 100-year flood elevation for the approximate study on the Chemung Feeder Canal was estimated using data obtained from the Flood Damage Reduction Study and from the topographic maps (References 7 and 10). Cutler, Erwin, and Post Creeks were studied by the slope/area method. The approximate 100-year flood elevation for these creeks was defined at selected field-surveyed cross sections.

All elevations used in this study are referenced to the National Geodetic Vertical Datum of 1929 (NGVD), formerly referred to as Sea Level Datum of 1929. Locations of the elevation reference marks used in the study are shown on the maps.

The hydraulic analyses for this study are based on the effects of unobstructed flow. The flood elevations shown on the profiles are valid only if hydraulic structures remain unobstructed, and dams and other flood control structures operate properly and do not fail.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

A prime purpose of the National Flood Insurance Program is to encourage state and local governments to adopt sound flood plain management programs. Each Flood Insurance Study, therefore, includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100- and 500-year floods have been delineated using the flood elevations determined at each cross section; between cross sections, the boundaries were interpolated using topographic maps at a scale of 1:2,400 with a contour interval of 5 feet (Reference 10). In cases where the 100- and 500-year flood boundaries are close together, only the 100-year boundary has been shown.

Flood boundaries for the ponding area upstream of State Route 17 were delineated using techniques similar to those used for the streams studied by detailed methods. After the approximate 100-year flood elevations were defined at selected field-surveyed cross sections, the flood boundary was then delineated between cross sections using the topographic maps (Reference 10).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 3). Small areas within the flood boundaries may lie above the flood elevations and, therefore, may not be subject to flooding. Owing to limitations of the map scale and lack of detailed topographic data, such areas are not shown.

4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood can be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced. The floodways in this report are presented to local agencies as minimum standards that can be adopted or that can be used as a basis for additional studies.

The floodways presented in this study were computed on the basis of equal conveyance reduction from each side of the flood plains. The results of these computations are tabulated at selected cross sections for each stream segment for which a floodway is computed (Table 2).

As shown on the Flood Boundary and Floodway Map (Exhibit 3), the floodway widths were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

Portions of the floodway widths on the Chemung River extend beyond the corporate limits of the Town of Corning.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood by more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 2.

Near the mouths of streams studied in detail, floodway computations are made without regard to flood elevations on the receiving water body. Therefore, "With Floodway" elevations presented in Table 2 for certain downstream cross sections of Whiskey Creek are lower than the regulatory flood elevations in that area, which must take into account the 100-year flooding due to backwater from other sources.

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHFs), and flood insurance zone designations for each flooding source affecting the Town of Corning.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Chemung River								
A	850[1]	1,600	19,285	4.1	898.8	898.8	899.5	0.7
B	3,020[1]	860	10,661	8.7	901.2	901.2	901.2	0.0
C	4,685[1]	864	13,274	6.9	904.9	904.9	905.2	0.3
D	6,105[1]	1,715	19,647	4.7	907.1	907.1	907.6	0.5
E	9,675[1]	2,086	20,589	3.9	909.3	909.3	909.9	0.6
F	14,035[1]	1,280	12,010	6.7	913.9	913.9	914.8	0.9
G	18,500[1]	1,628	21,091	3.8	917.9	917.9	918.9	1.0
H	19,710[1]	1,652[3]	23,323	3.4	918.2	918.2	919.2	1.0
I	20,435[1]	1,239[3]	11,667	6.9	918.2	918.2	919.2	1.0
J	21,530[1]	1,100	14,499	5.5	919.5	919.5	920.2	0.7
K	23,940[1]	708[3]	11,463	7.0	920.4	920.4	921.0	0.6
L	26,380[1]	733[3]	10,858	7.4	922.0	922.0	922.4	0.4
M	27,690[1]	740[3]	10,832	7.4	922.8	922.8	923.2	0.4
N	40,080[1]	743[3]	10,068	7.9	933.3	933.3	934.0	0.7
Whiskey Creek								
A	2,975[2]	750	2,122	2.3	917.8	914.0[4]	914.6	0.6
B	4,060[2]	290	781	6.3	918.0	915.8[4]	916.8	1.0
C	5,435[2]	350	1,281	3.9	924.1	924.1	924.3	0.2

[1]Feet above corporate limits
[2]Feet above confluence with Chemung River
[3]This width extends beyond corporate limits
[4]Elevations computed without consideration of backwater effects from Chemung River

TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

FLOODWAY DATA

CHEMUNG RIVER AND WHISKEY CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FT.)	SECTION AREA (SQ. FT.)	MEAN VELOCITY (F.P.S.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
Whiskey Creek (continued)								
D	6,815	230	649	7.6	937.7	937.7	937.7	0.0
E	7,935	208	605	8.2	952.5	952.5	953.2	0.7
F	9,120	80	393	12.6	968.4	968.4	969.2	0.8
G	10,335	70	410	12.1	983.1	983.1	983.6	0.5
H	11,575	90	407	12.2	1,001.2	1,001.2	1,001.2	0.0
I	12,065	100	421	11.8	1,010.6	1,010.6	1,010.6	0.0

[1]Feet above confluence with Chemung River

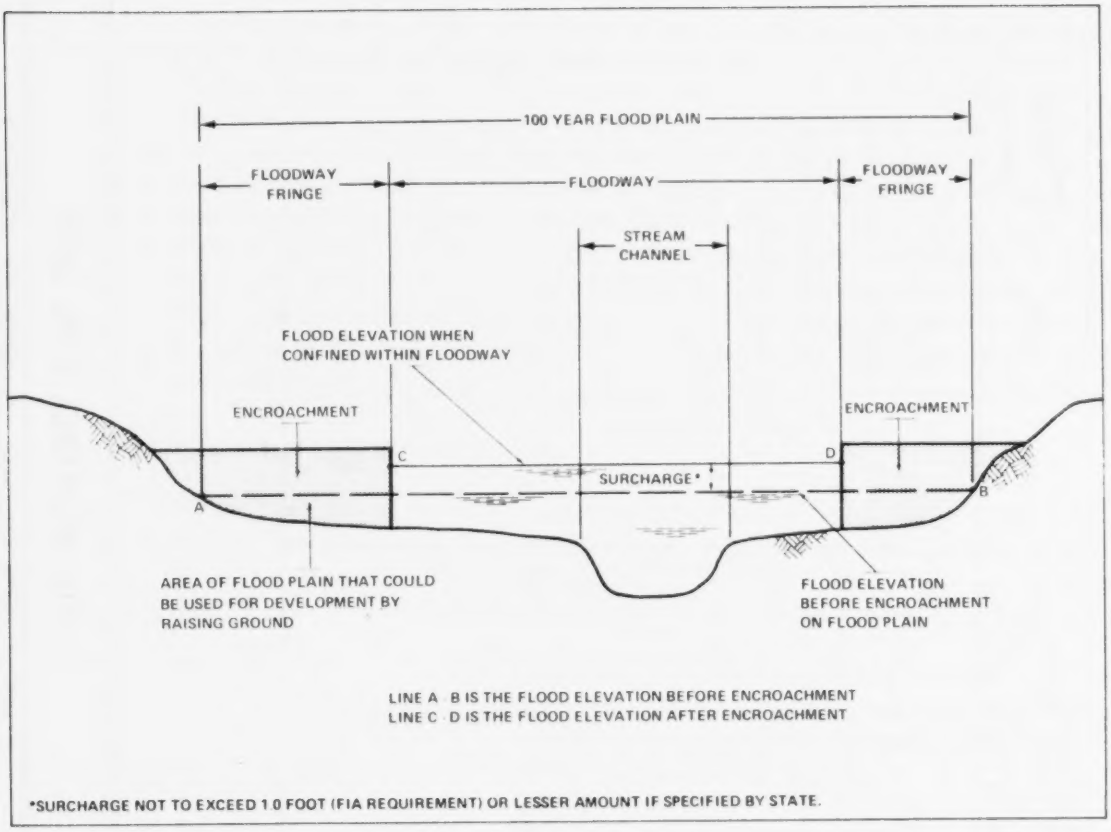
TABLE 2

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

FLOODWAY DATA

WHISKEY CREEK


100 YEAR FLOOD PLAIN
FLOODWAY FRINGE
FLOODWAY
FLOODWAY FRINGE
STREAM CHANNEL
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
C
D
SURCHARGE*
A
B
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE A B IS THE FLOOD ELEVATION BEFORE ENCROACHMENT
LINE C D IS THE FLOOD ELEVATION AFTER ENCROACHMENT
*SURCHARGE NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FLOODWAY SCHEMATIC

Figure 2

difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-Year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the flooding sources of the Town of Corning are shown on the Flood Profiles (Exhibit 1) and are summarized in the Flood Insurance Zone Data Table (Table 3).

5.2 Flood Hazard Factors

The FHF is the FIA device used to correlate flood information with insurance rate tables. Correlations between property damage from

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FHF	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10 YR.)	2% (50 YR.)	0.2% (500 YR.)			
Chemung River							
Reach 1	25	-4.7	-1.4	+3.4	045	A9	Varies
Reach 2	25	-4.2	-1.2	+3.3	040	A8	Varies
Reach 3	15, 25	-4.6	-1.5	+4.0	045	A9	Varies
Reach 4	10	-5.3	-1.6	+4.8	055	A11	Varies
Whiskey Creek							
Reach 1	25	-1.4	-0.6	+1.2	015	A3	Varies
Reach 2	25	-2.2	-0.9	+1.9	020	A4	Varies
Chemung Feeder Canal							
Upstream of State Route 17	25		PONDING			AH	899

[1]Flood Insurance Rate Map Panel
[2]Weighted Average
[3]Rounded to the nearest foot - see map

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

FLOOD INSURANCE ZONE DATA

CHEMUNG RIVER, WHISKEY CREEK AND CHEMUNG FEEDER CANAL

floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the entire incorporated area of Corning was divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations shown or FHFs determined.
Zone AH:	Special Flood Hazard Areas inundated by types of 100-year shallow flooding where depths are between 1.0 and 3.0 feet; base flood elevations are shown, but no FHFs are determined.
Zones A3, A4, A8, A9, A11:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; also, areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.

Zone C: Areas of minimal flooding.

Table 3, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for the flooding sources studied in detail in the Town of Corning.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the Town of Corning is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

A Flood Insurance Study for the Town of Big Flats was prepared together with this study (Reference 6). A Flood Damage Reduction Study on the Gardner Creek watershed was published in 1978 (Reference 7). A Flood Hazard Boundary Map for Corning was published in 1973 and revised in 1976 (Reference 15). This Flood Insurance Study is in agreement with the above mentioned studies.

Flood Plain Information was prepared for the Chemung River, downstream from the junction of the Tioga and Cohocton Rivers (Reference 11). The 100-year flood profiles on the Chemung River in this study disagree with the COE Intermediate Regional Flood profile in the Flood Plain Information. The data presented in this study were "tied in" with data from the Centerway gage in Chemung, New York, while the COE study did not use this gage in their analyses. The data presented here were accepted by the FIA.

This study is authoritative for purposes of the Flood Insurance Program, and the data presented here either supersede or are compatible with previous determinations.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic, and other pertinent data used in this study can be obtained by contacting the office of the Insurance and Mitigation Division of the Federal Emergency Management Agency, Regional Director, Region II, 26 Federal Plaza, Room 19-100, New York, New York 10278.

8.0 BIBLIOGRAPHY AND REFERENCES

1. U. S. Department of the Interior, Geological Survey, Water Supply Paper 1672, Magnitude and Frequency of Floods in the United States, Part 1-B, North Atlantic Slope Basins, New York to York River, by Richard H. Tice, Washington, D. C., U. S. Government Printing Office, 1965.

2. Chief of the Engineering Division, Baltimore District, U. S. Army Corps of Engineers, Personal Communication, May 1975.

3. U. S. Army Corps of Engineers, New York District, Hydrologic Study, Tropical Storm Agnes, New York, October 1975.

4. Water Resources Council, "Guidelines for Determining Flood Flow Frequency," Bulletin 17, Washington, D. C., March 1976.

5. U. S. Department of Agriculture, Soil Conservation Service, Syracuse District, Personal Communication, 1975.

6. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Town of Big Flats, Chemung County, New York (Unpublished).

7. Susquehanna River Basin Commission, Special Report, Flood Damage Reduction Study, Phase I - Existing Conditions Analysis, Gardner Creek Watershed, Town of Big Flats and Town of Corning, New York, Harrisburg, Pennsylvania, August 1978.

8. U. S. Army Corps of Engineers, Hydrologic Engineering Center, HEC-2 Water Surface Profiles, Generalized Computer Program, Davis, California, October 1973.

9. U. S. Department of Agriculture, Soil Conservation Service, Technical Release No. 20, Computer Program, Project Formulation, Hydrology, Washington, D. C., 1965.

10. Susquehanna River Basin Commission, Topographic Maps, Corning-Elmira Reach, Scale 1:2,400, Contour Interval 5 Feet, Harrisburg, Pennsylvania, 1974.

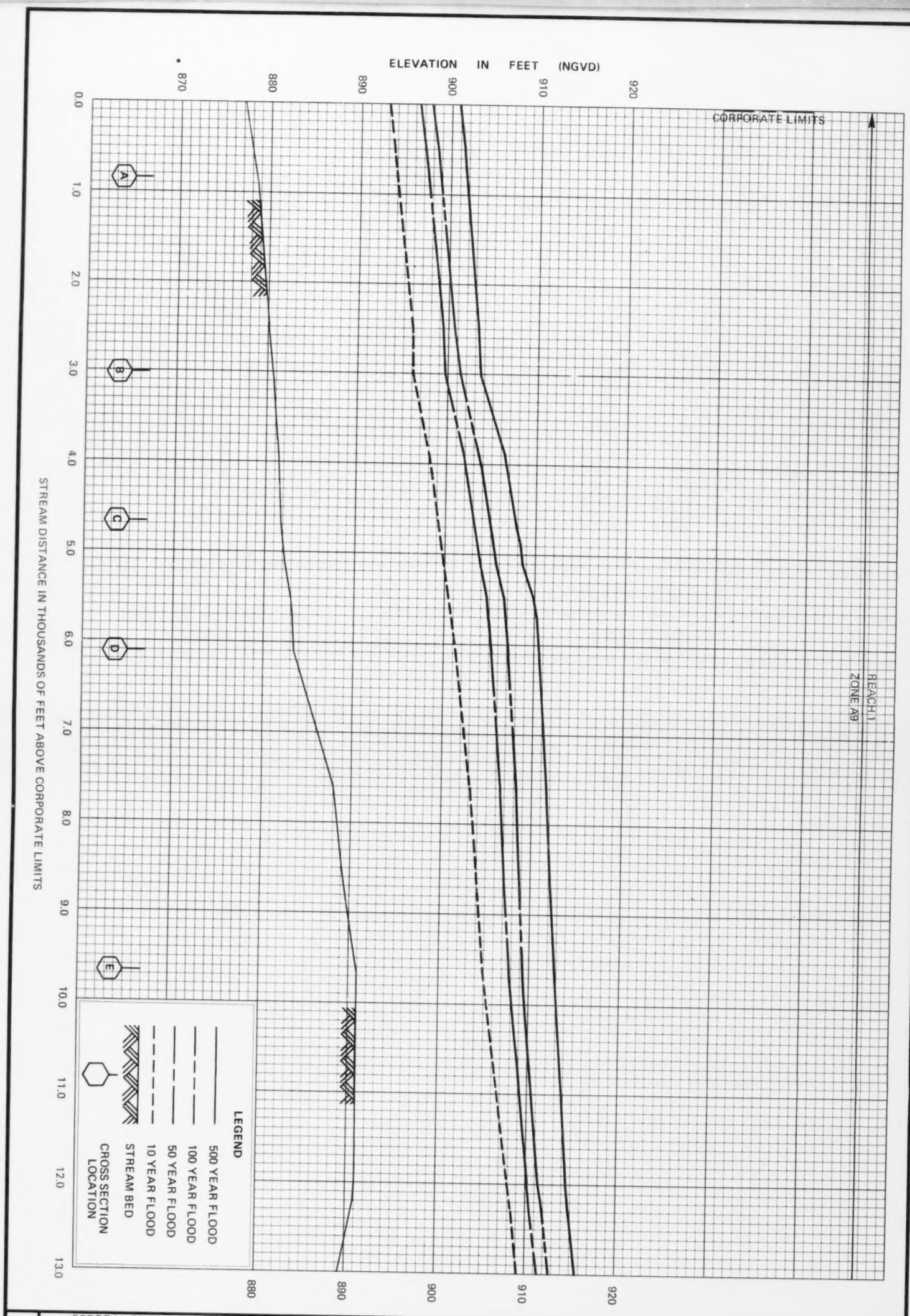
11. U. S. Army Corps of Engineers, Flood Plain Information, Chemung River, Steuben County, New York, New York, June 1974.

12. Ven Te Chow, Open-Channel Hydraulics, New York, McGraw-Hill, 1959.

13. U. S. Department of Commerce, Bureau of Public Roads, Hydraulic Design Series No. 3, Design Charts for Open Channel Flow, Washington, D. C., 1961.

14. U. S. Department of the Interior, Geological Survey, Professional Paper 924, Hurricane Agnes Rainfall and Floods, June-July 1972, Washington, D. C., 1975.

15. U. S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Town of Corning, Steuben County, New York, March 23, 1973, Revised October 8, 1976.



FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

FLOOD PROFILES

CHEMUNG RIVER

01P

REACH 1
ZONE A9

REACH 2
ZONE A8

CONFLUENCE OF WHISKEY CREEK

ELEVATION IN FEET (NGVD)

930
920
910
900
890
880

13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0 21.0 22.0

STREAM DISTANCE IN THOUSANDS OF FEET ABOVE CORPORATE LIMITS

F G H I J

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

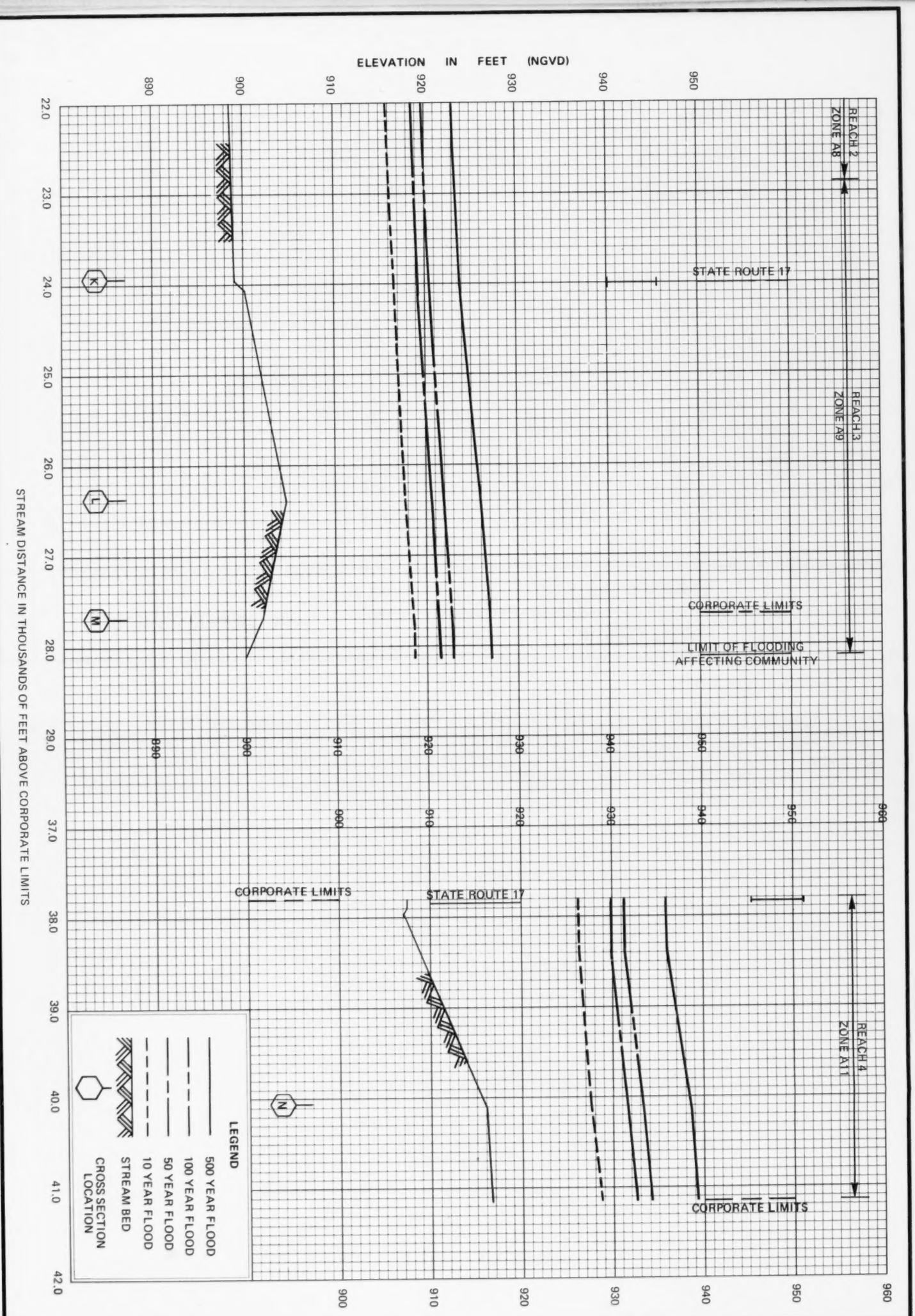
FLOOD PROFILES

CHEMUNG RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

02P



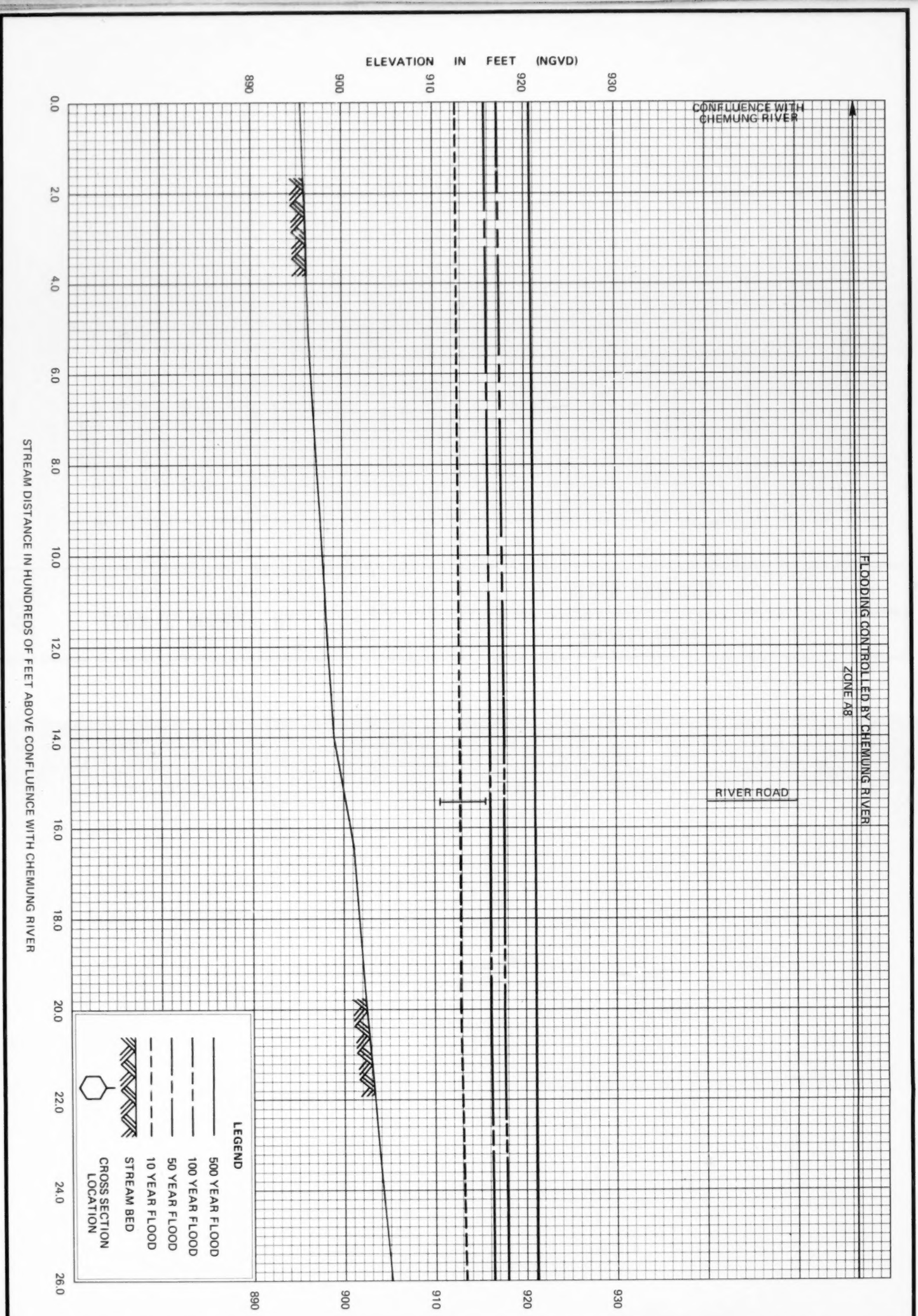
FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

FLOOD PROFILES

CHEMUNG RIVER

03P



04P

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

FLOOD PROFILES

WHISKEY CREEK

FLOODING CONTROLLED BY CHEMUNG RIVER
ZONE A8

REACH 1
ZONE A3

FARM LANE

ELEVATION IN FEET (NGVD)

930
920
910
900

LEGEND
- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

A
B

26.0 28.0 30.0 32.0 34.0 36.0 38.0 40.0 42.0 44.0 46.0 48.0 50.0 52.0

STREAM DISTANCE IN HUNDREDS OF FEET ABOVE CONFLUENCE WITH CHEMUNG RIVER

FLOOD PROFILES

WHISKEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

05P

REACH 1
ZONE A3

ELEVATION IN FEET (NGVD)

960
950
940
930
920
910

52.0 54.0 56.0 58.0 60.0 62.0 64.0 66.0 68.0 70.0 72.0 74.0 76.0 78.0

STREAM DISTANCE IN HUNDREDS OF FEET ABOVE CONFLUENCE WITH CHEMUNG RIVER

C

D

LEGEND

- 500 YEAR FLOOD
- 100 YEAR FLOOD
- 50 YEAR FLOOD
- 10 YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION

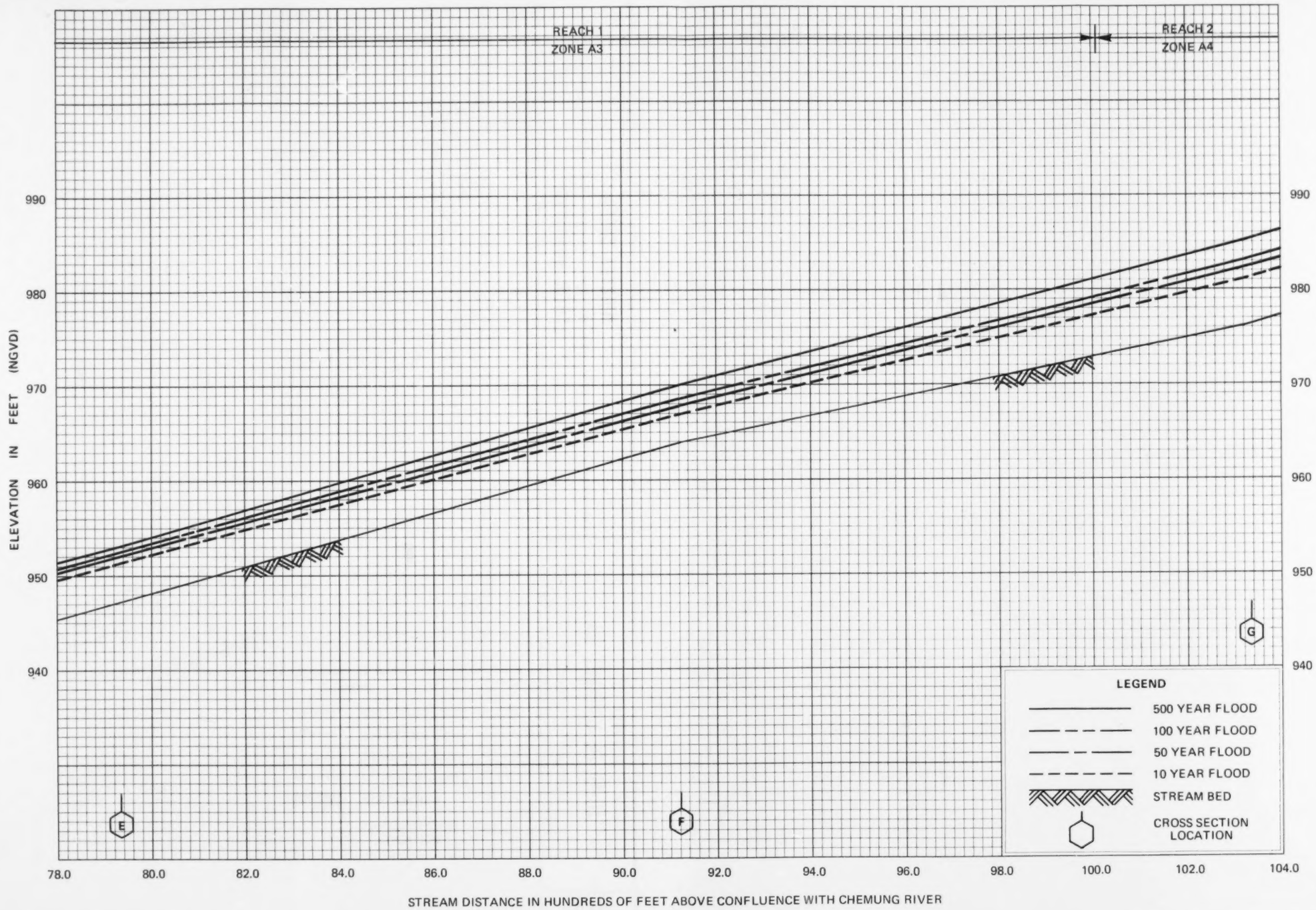
FLOOD PROFILES

WHISKEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

06P



FLOOD PROFILES

WHISKEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

07P

REACH 2
ZONE A4

LIMIT OF DETAILED STUDY

ELEVATION IN FEET (NGVD)

1020
1010
1000
990
980
970

1020
1010
1000
990
980

LEGEND

500 YEAR FLOOD
100 YEAR FLOOD
50 YEAR FLOOD
10 YEAR FLOOD
STREAM BED
CROSS SECTION LOCATION

H
I

104.0 106.0 108.0 110.0 112.0 114.0 116.0 118.0 120.0 122.0

STREAM DISTANCE IN HUNDREDS OF FEET ABOVE CONFLUENCE WITH CHEMUNG RIVER

FLOOD PROFILES

WHISKEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY
Federal Insurance Administration

TOWN OF CORNING, NY
(STEUBEN CO.)

08P